

EXHIBIT A
Petrolia Area Sediment Reduction Project
SCOPE OF WORK

Under direction of the Department of Fish and Game, and under the following conditions and terms, the Grantee will:

1. Improve habitat conditions for Chinook salmon, coho salmon and steelhead trout in the lower Mattole River and estuary area as well as multiple Mattole River tributaries including Bear, Mill, Conklin, Wild Turkey, Stansberry, East Mill, and Indian creeks. This will be done by reducing road related and stream bank sediment delivery. Project work will prevent the delivery of approximately 54,125 yds³ of sediment to the Mattole River and its tributaries.
2. The project is located in Township 2S, R 1W, Sections 1, 2, 3, 4, 9, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27 and Township 2S, Range 1W, Sections 6 and 7 of the Petrolia and Buckeye Mountain 7.5 Minute U.S.G.S. Quadrangles, as depicted in Exhibit B, Project Location Overview Map and Project Location Maps 1-3, which are attached and made part of this agreement by this reference.
3. Upgrade approximately seven (7) miles of road including upgrading 40 culverts, constructing 10 armored fills and upgrading 13 additional crossings through the construction of armored critical dips. The following treatments will be implemented where appropriate:
 - Installation of culverts sized for the 100-year flood flow, including sufficient capacity for expected wood and sediment;
 - Installation of bottomless arch culvert stream crossing;
 - Installation of critical dips to eliminate diversion potential;
 - Installation of rock armored fill crossings or fords;
 - Excavation and/or armoring of inboard ditches;
 - Excavation of culvert inlets;
 - Installation of downspouts and/or rock dissipation at culvert outlets;
 - Construction of rock armored fords;
 - Installation of rolling dips;
 - Reshaping of road surfaces;
 - Removal of berms;
 - Installation of ditch relief culverts;
 - Rocking of road surfaces;
 - Seeding and mulching of all exposed soils which may deliver sediment to a stream. Douglas fir seedlings will also be opportunistically planted. The standard for success is 80% survival of plantings or 80% ground cover for broadcast planting of seed, after a period of three years.
4. Decommission approximately 0.5 mile of road and 17 stream crossings. The following treatments will be implemented where appropriate:

- Excavation of in-place stream crossings at locations where roads or landings were built across stream channels. This includes complete excavation of the fill, including the culvert or Humboldt log crossing so the original stream bed and side slopes are exhumed. A stream crossing excavation includes removing the culvert and the underlying and the adjacent fill material. Complete excavation of stream crossing fills, includes 100 year flood channel bottom widths and 2:1 or otherwise stable side slopes. Armor stream crossings with rock where it will minimize post-decommissioning adjustments. When possible the excavated spoil will be stored at nearby stable locations where it will not erode. If there is a limited amount of stable storage locations at the excavation site the crossing fill material will be hauled off-site for storage.
 - Road surface treatments: 1) ripping of the surface of the road or landing using mechanical rippers to reduce surface runoff and improve revegetation; 2) in-place out-sloping or the excavation of unstable side cast material that could fail and deliver sediment to a stream along the outside edge of a road prism or landing and the replacement of the spoil on the roadbed against the corresponding adjacent cutbank, or in close proximity of the site; 3) exported out-sloping which involves not placing the material against the cutbank so the material is end hauled to a spoil disposal site; 4) installation of cross drains or deep water bars at 50, 75, 100 or 200 foot intervals or as necessary at springs and seeps to disperse road surface runoff. The cross road drains provide road surface drainage and prevent the collection of concentrated runoff on the former roadbed.
 - Seeding and mulching of all exposed soils which may deliver sediment to a stream. Woody debris will be concentrated on finished slopes adjacent to stream crossings. The standard for success is 80% ground cover for broadcast planting of seed, after a period of three years.
5. Implement instream treatments including the following:
- Construction of approximately nine (9) boulder deflectors at five (5) locations. The base of each structure will be keyed into a toe trench. Large wood will be incorporated into the structures where feasible;
 - Construction of willow structures (willow walls, baffles, brush fences and/or mattresses) in four locations to protect 600 feet streambank. Rip rap will be incorporated into the structures to improve structural integrity;
 - Excavate instream stored sediment and rearrange log debris accumulations to direct flows away from failing banks in four (4) locations;
 - Seeding and mulching of all exposed soils which may deliver sediment to a stream. Douglas fir seedlings will also be opportunistically planted. The standard for success is 80% survival of plantings or 80% ground cover for broadcast planting of seed, after a period of three years.
6. Proposed designs at project sites within the county road right of way need to be reviewed and approved by a county engineer.

7. The Grantee will not proceed with on the ground implementation until all necessary permits and consultations are secured.
8. All stream crossings will meet flow carrying capacity required for a 100 year flood event as identified by specifications determined by NOAA Fisheries and the California Department of Fish and Game.
9. All crossing upgrades in fish bearing reaches of streams will follow the National Marine Fisheries Service (NMFS 2001) Guidelines for Salmonid Passage at Stream Crossings and DFG criteria for adult and juvenile salmonid fish passage as described in the Third Edition, Volume II, Part IX, February 2003, of the *California Salmonid Stream Habitat Restoration Manual*. Culvert replacement or modification designs shall be visually reviewed and authorized by NOAA Fisheries (or DFG) engineers prior to commencement of work.
10. Sites which are expected to erode and deliver sediment to the stream are the only locations where work will be authorized for reimbursement under the terms of this agreement. Reimbursement will not be authorized for work done to improve aesthetics only.
11. The Grantee shall notify the Grant Manager a minimum of five working days before the project site is de-watered and the stream flow diverted. The notification will provide a reasonable time for Department personnel to supervise the implementation of the water diversion plan and oversee the safe removal and relocation of salmonids and other fish life from the project area. If the project requires dewatering of the site, and the relocation of salmonids, the Grantee will implement the following measures to minimize harm and mortality to listed salmonids:
 - Fish relocation and dewatering activities shall only occur between June 15 and October 31 of each year.
 - The Grantee shall minimize the amount of wetted stream channel dewatered at each individual project site to the fullest extent possible.
 - All electrofishing shall be performed by a qualified fisheries biologist and conducted according to the National Marine Fisheries Service, Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000.
 - The Grantee will provide fish relocation data to the Grant Manager on a form provided by the Department of Fish and Game.
 - Additional measures to minimize injury and mortality of salmonids during fish relocation and dewatering activities shall be implemented as described in Part IX, pages 52 and 53 of the *California Salmonid Stream Habitat Restoration Manual*.
12. The Grantee will maintain the new crossings, inspect the crossings in a timely manner and remove debris as necessary during the storm season.

13. The landowner must maintain road upgrading projects for at least 10 years.
14. All road upgrading or decommissioning will be done in accordance with techniques described in the Handbook for Forest and Ranch Roads, (PWA, 1994c.) and the *California Salmonid Stream Habitat Restoration Manual*, Third Edition, Volume II, Part X, January 2004. All road decommissioning and upgrade sites and techniques shall be approved by the Grant Manager before any equipment work takes place.
15. All habitat improvements will follow techniques described in the Third Edition, January 1998, of the *California Salmonid Stream Habitat Restoration Manual*, Flosi et al and the *California Salmonid Stream Habitat Restoration Manual*, Third Edition, Volume II, Part XI, January 2004.
16. Work in flowing streams is restricted to June 15 through October 31. Actual project start and end dates, within this timeframe, are at the discretion of the Department of Fish and Game.
17. Planting of tree seedlings will take place after December 1 or when sufficient rainfall has occurred to insure the best chance of survival of the seedlings. The standard for success is 80% survival of plantings or 80% ground cover for broadcast planting of seed, after a period of three years.
18. An annual report will be submitted each year, no later than November 15, detailing the work completed that field season. The annual report will include, but not necessarily be limited to the following where applicable:
 - Grant number
 - Project name
 - Geographic area (e.g., watershed name)
 - Location of work – show project location using U.S.G.S. 7.5 minute topographical map or appropriately scaled topographical map;
 - implementation start and end dates;
 - as built project description
 - percentage of the project completed to date;
 - dewatering and fish relocation data on DFG data sheet (to be provided by the DFG Grant Manager upon request);
 - projected start and end dates for work to be implemented the following season;

The annual report will also include, on a site by site basis:

- road length upgraded;
- number of stream crossings upgraded;
- number of landslides/fillslope failures treated;
- area (ft²) of landslide/fillslope failure treatments;
- road length decommissioned;
- number of stream crossings decommissioned;

- stream crossings treated for fish passage;
- length of stream habitat made accessible by fish passage treatment;
- sediment savings;
- spoils volumes;
- number of stream bank sites treated;
- length of stream bank protected or stabilized;
- instream habitat structures constructed;
- area of feature installed within bankfull width;
- number of stream blockages removed or made passable;
- number of miles made accessible to salmonids;
- number of trees planted;
- area treated with planting.

19. Upon completion of the project, the Grantee shall submit two hard copies of a final written report and one electronic, Microsoft Word compatible, copy on CD. The report shall include, but not necessarily be limited to the following information:
- Grant number;
 - Project name;
 - Geographic area (e.g., watershed name);
 - Location of work – show project location using U.S.G.S. 7.5 minute topographical map or appropriately scaled topographical map;
 - Geospatial reference/location (lat/long is preferred – defined as point, line, or polygon);
 - Project start and end dates and the number of person hours expended;
 - Total of each fund source, by line item, expended to complete the project, breaking down Grant dollars, by line item, and any other funding, including type of match (cash or in-kind service);
 - Expected benefits to anadromous salmonids from the project;
 - Labeled before and after photographs of any restoration activities and techniques;
 - Specific project access using public and private roads and trails, with landowner name and address;
 - Complete as built project description;
 - Report measurable metrics for the project by responding to the restoration project metrics listed below.

Habitat Protection and Restoration Projects– Reporting Metrics (Report N/A to those that do not apply)

Habitat Projects: (all)

- Identify the watershed/sub-basin plan or assessment in which the project is identified as a priority.
- Name the priority habitat limiting factors identified in that plan that are addressed by the project
- Type of monitoring included in the project

- Design spec achieved
- Fish movement/abundance
- Number of stream miles treated/affected by the project within the project boundaries.

Instream Habitat Projects (HI, HS)

- Description of instream treatments used, including site locations referenced to an established landmark, number of treatment sites, and any modifications to site/treatment design.
- Type of materials used for channel structure placement, select from: individual logs (unanchored); logs fastened together (logjam); rocks/boulders (unanchored); rocks/boulders (fastened or anchored); stumps with roots attached (root wads); weirs; gabions; deflectors/barbs; or other engineered structures
- Miles of stream treated with channel structure placement
- Number of instream pools created by structure placement
- Number of structures placed in channel.

Upland Habitat Projects (HU)

- Number of actions (road decommission / upgrade)
- Total acres of upslope area treated.
- Total miles of road treated.
- Miles of road treated for road drainage system improvements.
- Miles of road decommissioned.
- Number of cubic yards of sediment saved from entering the stream.

Fish Passage Improvement Projects (HB):

- Miles of stream treated.
- Types of crossings treated, select from: culvert, bridge or ford.
- Miles of stream made more accessible by treating stream crossings.
- Number of road crossings removed.
- Number of barriers other than culverts treated for fish passage.
- Miles of stream made more accessible by removing barriers other than culverts.

Riparian Habitat Projects (HR)

- Miles of stream treated overall, count stream reach only once.
- Miles of riparian stream bank treated, measure both sides of the bank.
- Total acres of riparian area treated.
- Acres of riparian area planted.
- Species scientific names of plants planted.

20. The Grantee will acknowledge the participation of the Department of Fish and Game, Fisheries Restoration Grant funds on any signs, flyers, or other types of written communication or notice to advertise or explain the Petrolia Area Sediment Reduction Project.

Exhibit B
Petrolia Area Sediment Reduction Project
Project Location Map 1
T 2S, R 2W, S 4, 9, 16, 17, 18, 19, 20, 21
Petrolia Quad - Humboldt County

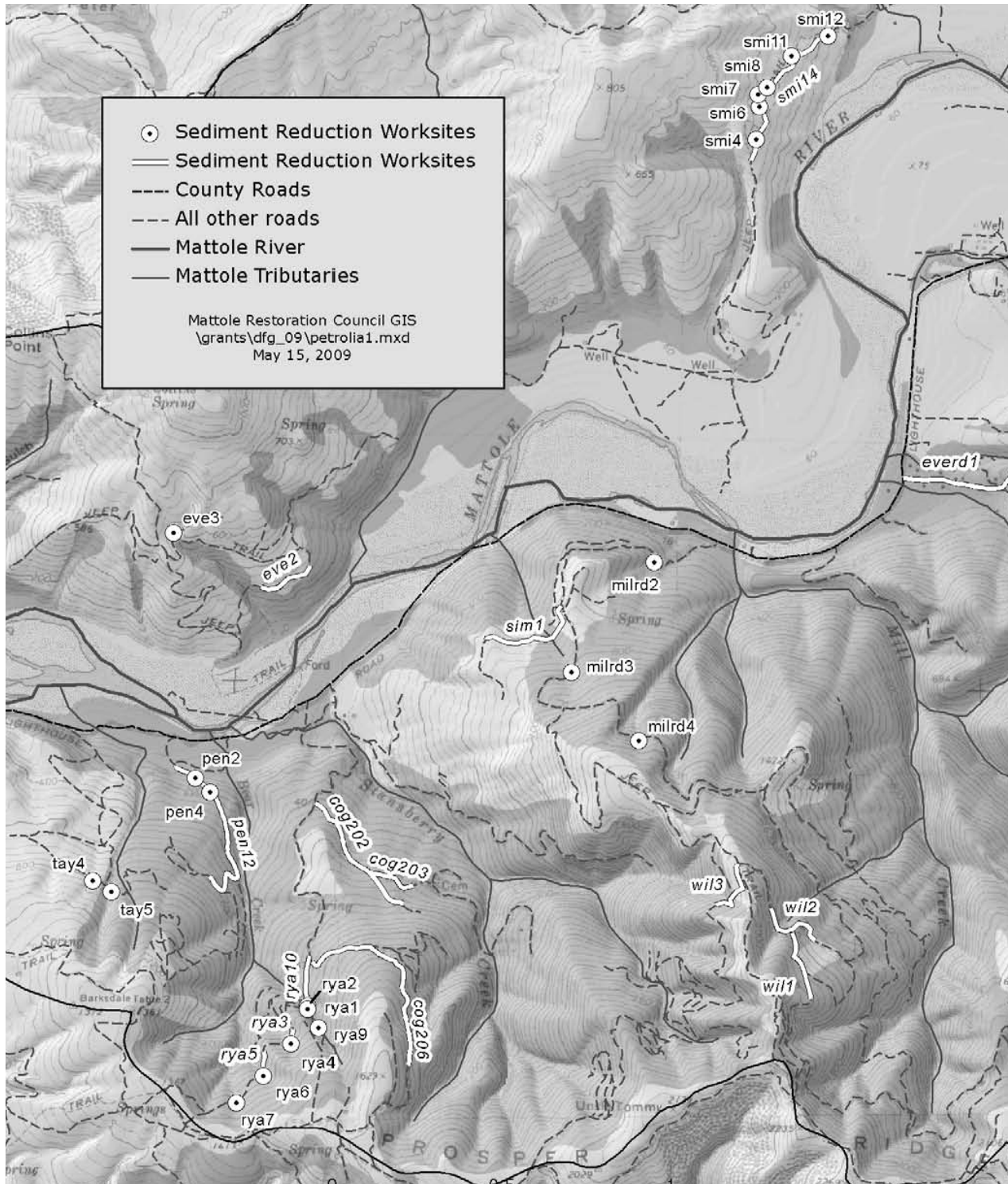
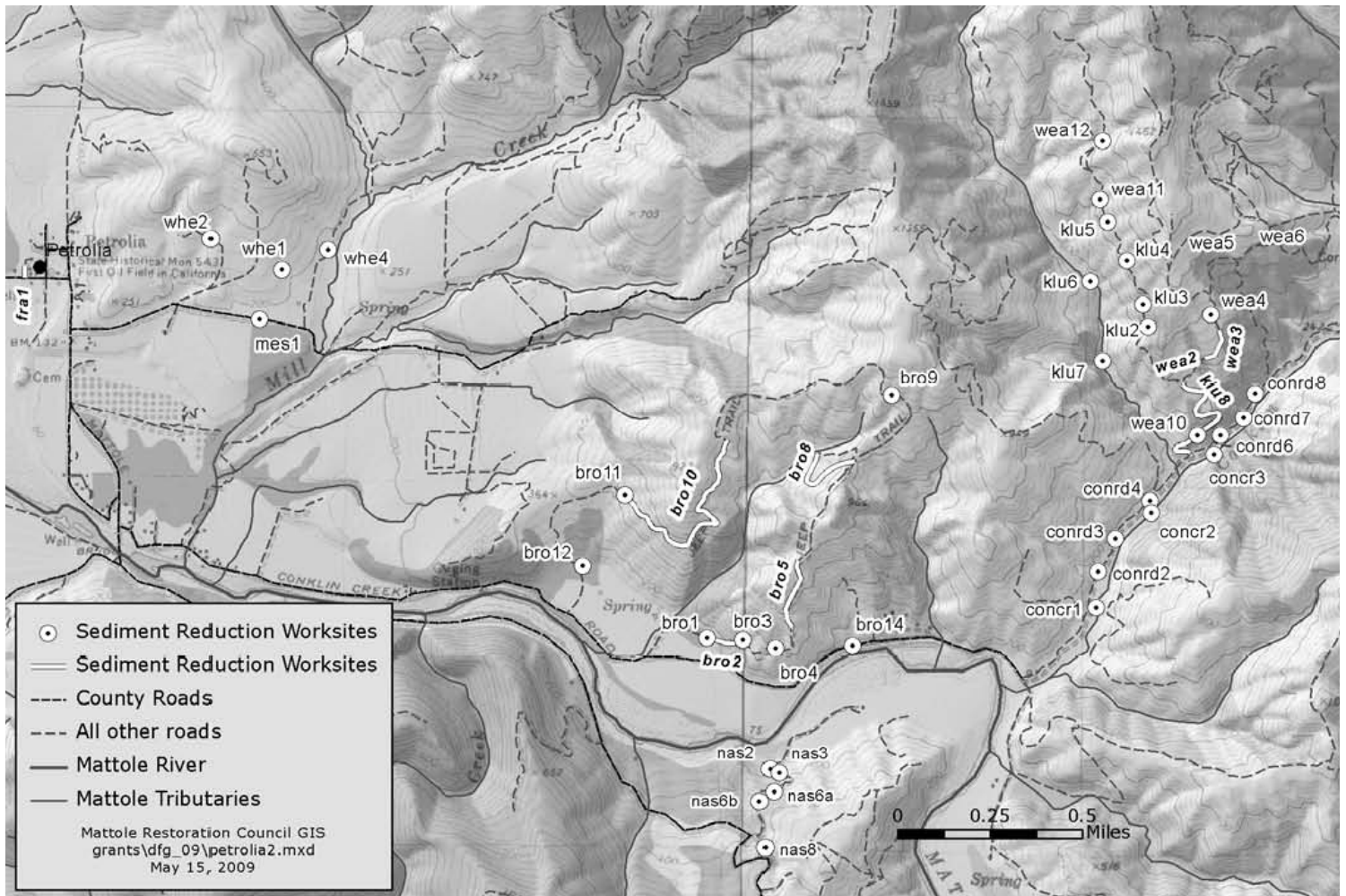


Exhibit B
Petrolia Area Sediment Reduction Project
Project Location Map 2
T 2S, R 2W, S 1, 2, 3, 11, 12 and 13; T 2S, R1W, S 6 and 7
Petrolia and Buckeye Mountain Quads - Humboldt County



Petrolia and Buckeye Mountain Quads - Humboldt County

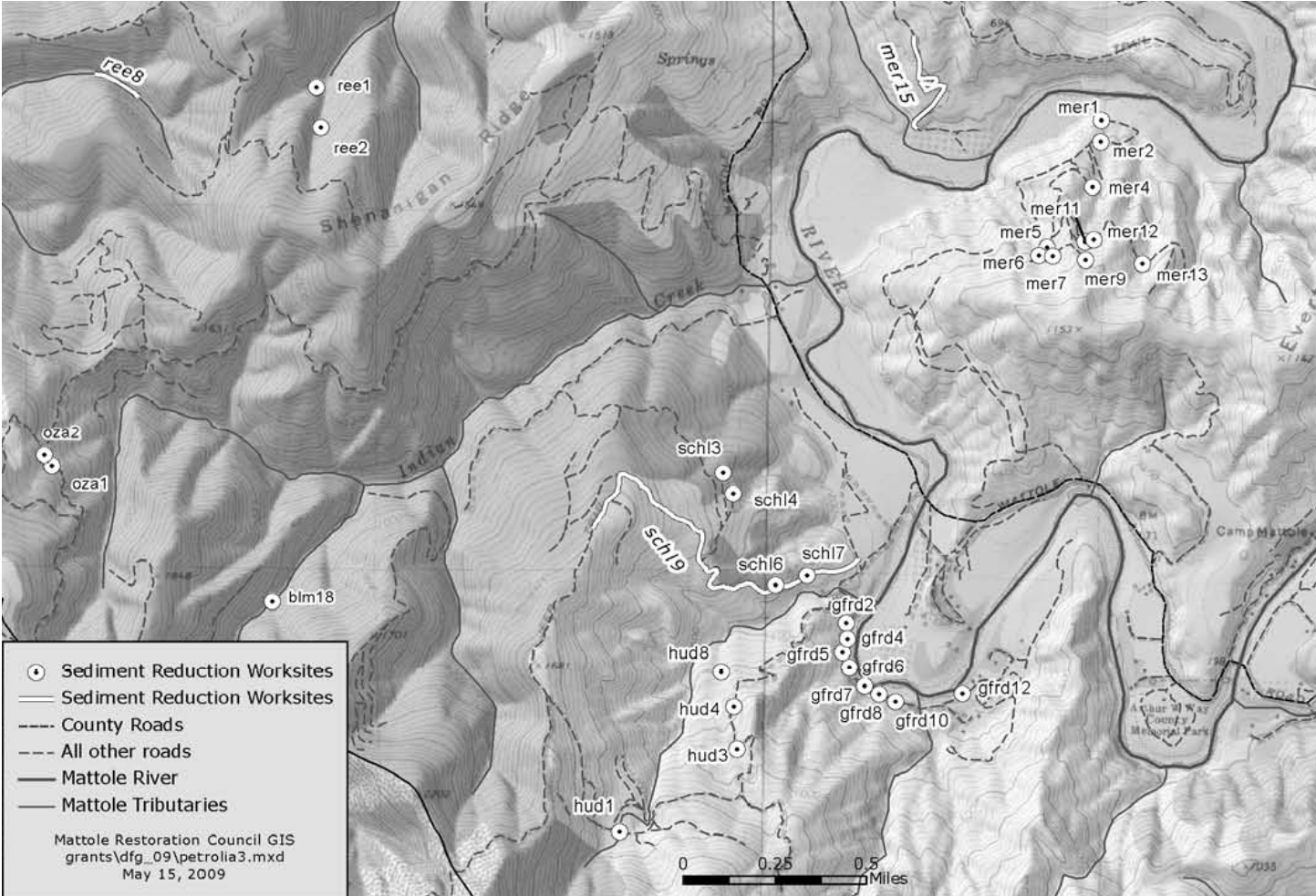
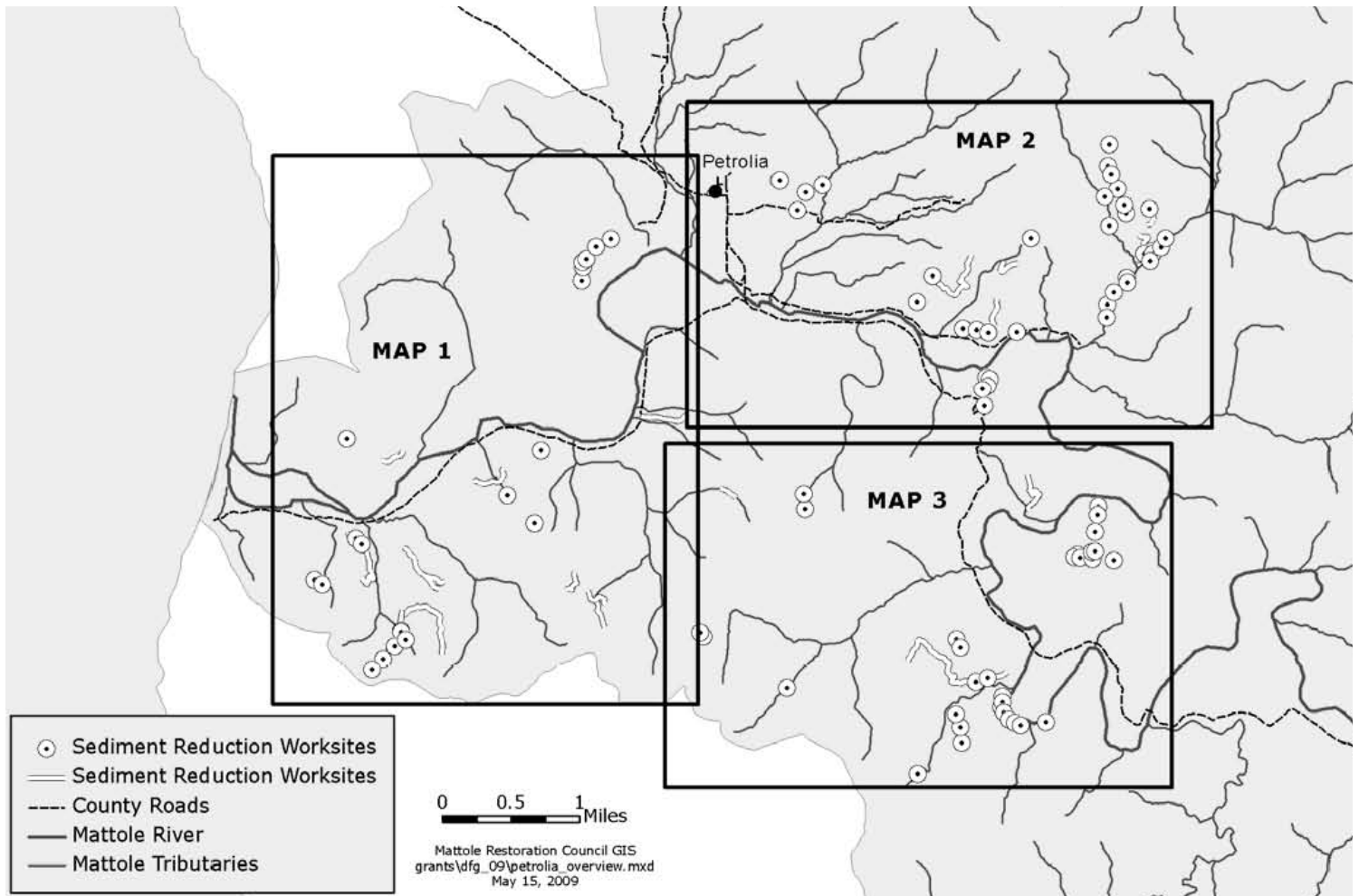


Exhibit B
Petrolia Area Sediment Reduction Project
Project Location Overview Map
T 2S, R 1W, S 1,2,3,4,9,11,12,13,15,16,17,18,19,20,21,22,23,24,25,26,27; T2S, R1W, S 6 and 7
Petrolia and Buckeye Mountain Quads - Humboldt County



California Department of Fish and Game

Natural Diversity Database

Selected Elements by Common Name - Portrait

Possible Species within the Petrolia, Buckeye Mountain and Surrounding Quads for:
Petrolia Area Sediment Reduction Project

Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 American badger <i>Taxidea taxus</i>	AMAJF04010			G5	S4	SC
2 Coastal Douglas Fir Western Hemlock Forest	CTT82410CA			G4	S2.1	
3 Coastal and Valley Freshwater Marsh	CTT52410CA			G3	S2.1	
4 Cooper's hawk <i>Accipiter cooperii</i>	ABNKC12040			G5	S3	
5 Hitchcock's blue-eyed grass <i>Sisyrinchium hitchcockii</i>	PMIRI0D0S0			G2	S1.1	1B.1
6 Howell's montia <i>Montia howellii</i>	PDPOR05070			G3G4	S3	2.2
7 Oregon coast paintbrush <i>Castilleja affinis ssp. litoralis</i>	PDSCR0D012			G4G5T4	S2.2	2.2
8 Oregon polemonium <i>Polemonium carneum</i>	PDPLM0E050			G4	S1	2.2
9 Pacific gilia <i>Gilia capitata ssp. pacifica</i>	PDPLM040B6			G5T3T4	S2.2?	1B.2
10 Pacific tailed frog <i>Ascaphus truei</i>	AAABA01010			G4	S2S3	SC
11 Siskiyou checkerbloom <i>Sidalcea malviflora ssp. patula</i>	PDMAL110F9			G5T1	S1.1	1B.2
12 Sonoma tree vole <i>Arborimus pomo</i>	AMAFF23030			G3	S3	SC
13 Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010			G4	S2S3	SC
14 Upland Douglas Fir Forest	CTT82420CA			G4	S3.1	
15 Wolf's evening-primrose <i>Oenothera wolfii</i>	PDONA0C1K0			G1	S1.1	1B.1
16 Yuma myotis <i>Myotis yumanensis</i>	AMACC01020			G5	S4?	
17 beach layia <i>Layia carnosa</i>	PDAST5N010	Endangered	Endangered	G2	S2.1	1B.1
18 coast fawn lily <i>Erythronium revolutum</i>	PMLIL0U0F0			G4	S3	2.2
19 coastal marsh milk-vetch <i>Astragalus pycnostachyus var. pycnostachyus</i>	PDFAB0F7B2			G2T2	S2.2	1B.2
20 coho salmon - central California coast ESU <i>Oncorhynchus kisutch</i>	AFCHA02034	Endangered	Endangered	G4	S2?	
21 double-crested cormorant <i>Phalacrocorax auritus</i>	ABNFD01020			G5	S3	
22 foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050			G3	S2S3	SC
23 giant fawn lily <i>Erythronium oregonum</i>	PMLIL0U0C0			G5	S2.2	2.2
24 golden eagle <i>Aquila chrysaetos</i>	ABNKC22010			G5	S3	

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Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
25 great blue heron <i>Ardea herodias</i>	ABNGA04010			G5	S4	
26 great egret <i>Ardea alba</i>	ABNGA04040			G5	S4	
27 leafy reed grass <i>Calamagrostis foliosa</i>	PMPOA170C0		Rare	G3	S3.2	4.2
28 long-beard lichen <i>Usnea longissima</i>	NLLEC5P420			G4	S4.2	
29 maple-leaved checkerbloom <i>Sidalcea malachroides</i>	PDMAL110E0			G3G4	S3S4.2	4.2
30 marbled murrelet <i>Brachyramphus marmoratus</i>	ABNNN06010	Threatened	Endangered	G3G4	S1	
31 mountain shoulderband <i>Helminthoglypta arrosa monticola</i>	IMGASC2035			G2G3T1	S1	
32 northern red-legged frog <i>Rana aurora</i>	AAABH01021			G4T4	S2?	SC
33 northern spotted owl <i>Strix occidentalis caurina</i>	ABNSB12011	Threatened		G3T3	S2S3	SC
34 osprey <i>Pandion haliaetus</i>	ABNKC01010			G5	S3	
35 running-pine <i>Lycopodium clavatum</i>	PPLYC01080			G5	S4.1	4.1
36 seacoast ragwort <i>Packera bolanderi</i> var. <i>bolanderi</i>	PDAST8H0H1			G4T4	S1.2	2.2
37 sharp-shinned hawk <i>Accipiter striatus</i>	ABNKC12020			G5	S3	
38 short-leaved evax <i>Hesperrevax sparsiflora</i> var. <i>brevifolia</i>	PDASTE5011			G4T2T3	S2S3	1B.2
39 southern torrent salamander <i>Rhyacotriton variegatus</i>	AAAAJ01020			G3G4	S2S3	SC
40 summer-run steelhead trout <i>Oncorhynchus mykiss irideus</i>	AFCHA0213B			G5T4Q	S2	SC
41 tufted puffin <i>Fratercula cirrhata</i>	ABNNN12010			G5	S2	SC
42 white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050			G3	S3.2	1B.2
43 willow flycatcher <i>Empidonax traillii</i>	ABPAE33040		Endangered	G5	S1S2	